

A **PLASTIC** PLANET

THE COMPOSTABLE CONUNDRUM

MAKING SENSE OF WHEN TO USE
COMPOSTABLE MATERIALS

THE RED & GREEN LIST



Last updated October 2021

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A WORKING DOCUMENT FOR DESIGNERS

There is one simple guiding question to be asked when considering the correct use of compostable materials. 'Does this help get food waste into the food waste system?' If the answer is yes, it is a good use of a compostable. If the answer is no, it is probably not.

This is a working paper designed to inform and shape a growing number of conversations on plastic pollution and compostable materials. With legislation fast approaching which will make separate food waste collections mandatory across the EU block and England¹ and rising public frustration with plastic packaging, **clarity is needed on when it is responsible to use compostable materials and when it makes sense to use another material.**

This document is initially designed for the people who choose which materials to use for packaging and products at the very beginning of the process – **packaging designers and brand managers.** With greater knowledge and understanding of the pros and cons of using compostable materials, this document will have succeeded if there is less 'mis-use' - no-one wants to use a compostable material that ends up in landfill or an incinerator - and a greater value placed on these materials, which like everything we produce and buy, use precious and limited resources. This document and the Red & Green list will be updated periodically.

Ultimately this document focuses on one issue of concern - the health of our soils. It starts with soil. It ends with soil. Good quality, healthy soils are essential to our survival as a species.

A credible **compostable packaging industry** cannot be developed without the **infrastructure to process organic waste**, and both need to be managed through a clear set of **regulations** and **legislation** underpinned by a consensus on what constitutes a responsible and appropriate use of compostable materials.

We hope this document contributes to that conversation.²



¹ Scotland, Northern Ireland and Wales already have separate food waste collection systems in place.

² This document does not refer to the use of certified soil biodegradable plastics (according to the standard EN17033) used in agricultural activities nor to compostable products that are not packaging but focusses entirely upon packaging uses.

LANGUAGE

These following words are defined and understood as follows in the context of this document.

BIODEGRADABLE or COMPOSTABLE

The word 'biodegradable' is used increasingly liberally on packaging product labelling and suggests that the product breaks down benignly at the end of its life. However, there is no harmonised standard for 'biodegradability', which means claims using the word are unsubstantiated and wide open to interpretation. Because of this ambiguity, the word biodegradable is not used in this document. Instead, we refer to 'compostable' for which there are clear internationally agreed standards which use **specific** tests under **defined** temperatures, within maximum **timeframes** in laboratory and plant and soil toxicity tests. Products may pass or fail, and all are evaluated using the same metrics.³ We strongly recommend that the term "biodegradable" for marketing of packaging is banned in the EU and UK following the example of the 2008 law passed by the Belgian Government.⁴



HOME or INDUSTRIAL

The word compostable in this paper refers to industrially compostable⁵ not home compostable. Whilst home composting is practiced and codified in some EU nations, industrial composting and Anaerobic Digestion (AD) are legally recognised as waste recycling operations whereas home composting, which is carried out using a variety of methods, is generally not codified.⁶

PACKAGING, PRODUCTS & MATERIALS

We typically understand the following three words as follows:

PACKAGING

the protection that protects and delivers a product (a breakfast cereal box).

PRODUCT

The item or contents inside the packaging (the cereal).

MATERIALS

The raw materials used to make the product or packaging (grain or paper).

In the context of this discussion about compostable materials, certain 'products', for example teabags, coffee pods and bin liners, are also the 'packaging.' For simplicity, the word '**materials**' is therefore used to cover '**products**' and '**packaging**' in certain sections of this document. In legislative terms however, the nuance of language is important because to be certified as compostable, the assessment and certification is completed for the **finished product**, or a manually separable **component** of a finished product and the labelling must clearly state if the whole finished product or specific component(s), are compostable.

3 Tests check concentrations of 11 'heavy metals', disintegration, effects on plant germination and growth, biodegradation and 9 aspects of compost quality.

4 <https://www.health.belgium.be/en/environment/placing-products-market/biodegradable-and-compostable-materials>

5 As per criteria specified in the EN13432 standard.

6 A packaging that is certified Home Compostable will generally compost in industrial composting facilities too.

WHEN AND WHY USE COMPOSTABLE MATERIALS?

In the rush to divest away from plastic, compostable packaging and products have rapidly become the new, 'better' eco-friendly option. Salad bags, windows in cartons, coffee cups, chocolate wrappers and protective sleeves for magazines and newspapers – to name a few – are appearing on our shop shelves or coming through our letter boxes packaged in compostable materials.

We present three interconnected positions to answer a single question: **When should compostable materials be used and why?**

THE POSITIONS

THE HEALTHY SOILS POSITION

Food Waste: Approximately 20% of the food produced in the EU each year is lost or wasted, costing €143 billion. Apart from the moral bankruptcy of this system, we are throwing away this rich resource to be incinerated or landfilled when it could be regenerating our soils. Part of the solution may be as straightforward as legislating that all carrier bags are compostable which would allow them to be used as food caddy liners to capture increased quantities of food waste.

Soil Pollution: Our soils are x4-23 times more polluted with plastic than our oceans.⁷ This should be ringing very loud alarm bells. There is also an extraordinary opportunity with separate food waste collection across the EU coming into force in 2024 to reroute food waste from incinerators and landfill to compost sites using compostable packaging as the conduit and to return it to soil as high-grade compost.

THE ECONOMIC POSITION

Italy has the most advanced organic waste collection system in Europe and possibly the world. Every year the cost to strip out materials that look like plastic from their organic waste stream costs €90-120 million each year. The EU's bill will be significantly higher unless certain products are mandated to use compostable materials and the volume of plastic is significantly reduced in the entire system. Without action, this will be a significant, wholly inappropriate and unacceptable transfer of the public's financial resources from food waste treatment to incineration.

THE CLIMATE CRISIS POSITION

There are three natural carbon sinks. Our oceans and atmosphere are absorbing dangerous amounts of carbon while our soils desperately need more. The 4:1000 Initiative estimates that an annual increment of organic carbon of just 0.4% is the equivalent of all annual global Green House Gas emissions. Improving soil quality therefore has a dramatic impact.



REASONS FOR OPTIMISM

With a Red & Green list to guide a more deliberate and careful use of compostable materials in appropriate formats and contexts, a significantly greater volume of food waste could be captured and converted to high quality compost. A Red & Green list is also extremely timely for two additional reasons: guiding legislation and minimising confusion.

LEGISLATION

From 1 January 2024, kerbside collection of household food waste will be mandatory across all 27 EU Member States⁸ and the UK. To successfully re-route the estimated 50M metric tonnes⁹ of food waste and organic matter away from incinerators and landfills and towards composting facilities while reducing the current levels of plastic contamination needs a consensus on when and why compostable materials should be used.

⁷ <https://www.sciencedaily.com/releases/2018/02/180205125728.htm>

⁸ Separate food waste collections from domestic and non-domestic sources will be phased in during 2023/24 in England. They are already mandatory in Scotland, Wales and N. Ireland.

⁹ Bio-waste generation in the EU: Current capture levels and future potential. BIC and Zero Waste Europe, 2020

CONFUSION

Designers and brand owners are pivotal players. Long before a product is manufactured and irrespective of whether it is a sandwich box or a laundry detergent bottle, a designer decides on which materials to use. But designers are confused about the pros and cons of compostable materials. This confusion has been compounded by (a) a lack of guidance created specifically for the design community (b) slow and geographically variable acceptance of compostable packaging into food waste collections (c) a drive to improve the recyclability of packaging which has led to big retailers issuing their own red and green lists. Unfortunately, this has stifled innovation and established fire walls for new materials and products reaching our shop shelves.

The end result? Designers and brands continue to default to plastic. Plastic remains eye-wateringly cheap, it is light weight, printable, flexible, mouldable, highly versatile – and indestructible. In addition, designers and brand owners have traditionally focused upstream on the qualities of a material which will safely package and deliver their product. Scant attention has been paid to looking downstream and engaging with the organisations who manage products at the end their life. Using compostable materials has therefore been evolving in a vacuum with insufficient engagement with composting and AD facility operators and the trade associations who represent them. The fundamental questions that must now be asked are:

- Are composting and AD facilities willing and able to manage compostable products?
- What needs to happen to unlock more widespread access to these facilities for compostable materials?
- How can we ensure greater transparency on material composition?¹⁰ In other words, if compostable materials are going to be used for compost, a nation-wide discussion on additives used across all materials is needed.¹¹

THE GOAL

The ultimate goal of this document is to pivot the discussion firmly away from 'compostable materials are better because they are not plastic' and towards a new story arc where 'compostable materials play a key role in capturing biowaste¹² which can be converted into high quality compost and digestate to regenerate our rapidly depleting agricultural soils.'¹³

Using compostable materials for packaging more wisely is a vital discussion for farmers, citizens, brands and the waste management industry and the conversation needs to start with designers.

BAN OR 'NICE TO HAVE'?

A final note on urgency. We believe that capturing food waste and creating high quality compost and digestate, instead of burning or landfilling it, is not a nice-to-have option. We believe governments and the European Commission need to act with the same clarity as was needed to ban asbestos, CFC aerosols, smoking and driving without a seat belt. Capturing uncontaminated food waste should not be optional. It is now imperative.

CHANGING THE RATIONALE

From "Compostable materials are a substitute for plastic" to "Compostable materials carry food waste to the food waste system."

With this shift, we could use **less plastic**, **protect our soils** and **respect** the composting industry for its role in converting food and compostable waste into black gold and AD sites for their production of digestates and biogas.

¹⁰ Recent studies have shown that the current shift from plastic to paper is leading to an increasing number of toxic additives: <https://www.sciencedirect.com/science/article/pii/S0160412020320213>

¹¹ The US BPI certification is the only system which screens for material composition. This type of program should be mandatory.

¹² The EU Waste Framework Directive's definition of bio-waste is 'biodegradable garden and park waste, food and kitchen waste from households, offices, restaurants, wholesale, canteens, caterers and retail premises and comparable waste from food-processing plants'

¹³ Compostable packaging is highly appropriate for food packaging in closed loop situations (festivals) where the packaging and leftover food can be more easily recovered together.

WHO WILL USE OR BENEFIT FROM A RED & GREEN LIST?

Three groups are expected to use the Red & Green list and three groups to benefit from it.

WHO	ISSUES	BENEFITS	EXPECTED RESULTS
RED & GREEN LIST USERS			
PRODUCT DESIGNERS & BRAND OWNERS	<p>Designers and brand owners sit at a pivotal point in the supply chain: they decide what materials to use for products sold by the million on the open market.</p> <p>This sector is currently confused about the pros and cons of using compostable materials which means they are either mis-specifying compostable materials or defaulting to plastic.</p> <p>For brand owners of certain food products, there are shelf-life benefits from using compostable packaging that are currently not being realised.</p>	A single Red & Green list will help designers to use compostable packaging wisely and deliberately, not blindly.	<p>A higher volume of products appropriately packaged in compostable materials and consciously designed with their end of life (i.e. the food waste bin) firmly in mind at the design stage.</p> <p>A raised understanding and more careful use of compostable materials which use precious and limited raw materials to produce.</p> <p>>> A cleaner and higher capture of organic waste.</p>
RETAILERS	<p>Individual retailers are issuing their own guidance indicating whether they will, or will not, accept compostable packaging. This has (a) significantly impacted brands trying to devolve away from unrecyclable plastics who are unable to supply into these retailers (b) increased confusion among brand owners (c) stifled innovation because it is less risky and easier to play it safe by continuing to use plastic (despite the extremely low rate of actual plastic recycling in the UK and beyond).</p>	A single reference Red & Green list adopted by all major retailers will (a) provide an even playing field and clarity for brands trying to use innovative materials (b) help shoppers to know that certain products are always manufactured using compostable materials and therefore always go in the food waste-bin.	<p>Consistently using compostable materials for specific applications will (a) increase the availability of these products across all retailers rather than a limited number of smaller outlets stocking them (b) reduce the confusion for shoppers (c) translate to less work to remove suspicious looking packaging, lower the associated costs and result in a higher organic capture rate for the food waste industry who will benefit from knowing product types A, B and C are all compostable (d) reduce the plastic contamination in food waste and improve the quality of the resulting compost returning to agricultural soils.</p> <p>>> A cleaner and higher capture of organic waste.</p>

Table continues >>

WHO	ISSUES	BENEFITS	EXPECTED RESULTS
RED & GREEN LIST USERS			
LEGISLATORS	The remit of environmental legislation is wide and far-reaching ranging from fit-for-purpose waste management systems, water and land protection measures and anti-pollution laws.	A single and agreed Red & Green list which indicates which products should and should not use compostable materials would assist UK/EU legislators to enact policies to guide a uniformly more responsible use of compostable materials.	Clear and binding legislation is the ultimate game changer. By harmonising the use of compostable materials for certain products it will make it easier to streamline their collection at their end of life and will also offer protection for the raw materials used to make compostable products.
RED & GREEN LIST BENEFICIARIES			
CITIZENS	With (a) an increasing number of recycling and certification marks on products (b) a rising number and varied array of coloured bins outside homes for different waste streams (c) unclear instructions on where to correctly dispose of a product with ambiguous wording like 'biodegradable', it is unsurprising that citizens are confused.	With a Red & Green list to guide a rational use of compostable materials for certain products plus clear labelling and national awareness and education campaigns, citizens will be clearer on which products go into their food waste bin. Touching out-of-date food and food waste in general puts many households off collecting their food waste. Using compostable food caddy liners or compostable carrier bags can considerably increase food waste collections.	Changing population wide patterns of behaviour including our recycling habits and collecting food waste at home is challenging, however if citizens know and understand that certain items always go in the food waste bin – it becomes easier to lock in the new behaviour and make it consistent. With less confusion, a higher capture rate of compostable packaging with left-over food scraps is expected which in turn leads to a higher organic waste capture rate. >> A cleaner and higher volume organic waste stream.
COMPOSTING & AD INDUSTRIES¹⁴	Composters are currently unable to differentiate between compostable and non-compostable packaging: a fossil-fuel plastic bag and a biomaterial compostable bag look identical. Composters and AD plants therefore spend significant time and investment in stripping out all packaging which looks like plastic which then goes to landfill or Waste-from-Energy sites.	An example: If 100% of tomato ketchup sachets were mandated to use compostable materials independently certified compliant with EN13432, composters and AD operators would have greater assurance that ketchup sachets seen in the mix, were compostable and would not need to be stripped out or could be sent to composting pre or post anaerobic digestion.	With less confusion and more accurate disposal of certain products by citizens – we would expect lower contamination levels of plastic and greater waste disposal confidence. >> A cleaner and higher volume organic waste stream.

¹⁴ Where household food waste is collected for IVC treatment, compostable liners and re-purposed compostable bags are supplied (or recommended) by the local authority and those liners/bags are fed into the composting processes.

POSITIONS IN SUPPORT OF A RED & GREEN LIST

Three positions illustrate why a Red & Green list is crucial before food waste collections become mandatory across the UK and EU. Each position is briefly described with a context, a threat and an opportunity.

A. FOOD WASTE & HEALTHY SOILS POSITION

CONTEXT & THREAT

Our soils are x4-23 times more polluted with plastic than our oceans.¹⁵ This should be raising a very loud alarm bell: 95% of our food supply relies on healthy soils¹⁶; the majority of our drinking water flows over or through soil; soils protect against flooding and contain significant organic carbon and biodiversity essential to the overall function of the biosphere.¹⁷

In areas of the EU, long term soil damage has been caused directly by the continual loading of **plastic-bearing materials** including soil mulch, compost and digestate. The majority of this plastic in the form of small particles which are extremely hard, if not impossible, to remove.¹⁸

Soil pollution increases food insecurity by (a) reducing crop yields due to toxic levels of contaminants (b) causing crops produced from polluted soils to be unsafe for animal and human consumption.¹⁹ In parallel, plastic packaging pollution of organic waste streams leads to poor quality compost - which in turn hinders soil regeneration. Micro and nano-plastics are already found within leafy greens, fruits and other vegetables.²⁰

On the flip side. In the EU, 20% of the food produced each year is lost or wasted, costing an estimated €143 billion. This rich organic resource is predominantly incinerated or landfilled. Apart from the moral bankruptcy of a system set up to over-produce and then discard, we are throwing away an invaluable product which could regenerate soils while simultaneously using precious resources to produce artificial fertilisers. On a global scale, approximately 1/3 of all the world's food goes to waste, and producing, transporting and letting that food rot releases 8-10% of global greenhouse gases.²¹

OPPORTUNITY

An estimated further 50 million tonnes of food waste could be collected with optimised collection systems across the UK and EU. Removing food waste from landfill will reduce methane and emissions and return organic carbon to soil - both vitally important as we look forwards.

B. THE ECONOMIC POSITION

CONTEXT

Significant financial costs are associated with (i) removing non-compostable plastics from organic waste streams (ii) agricultural fertility loss due to plastic contamination of soils and (iii) the environmental costs linked to greenhouse gas emissions from burning biomaterials in energy-from-waste plants.²²

Using data from Italy²³ where systems to capture and treat food waste have been in place for over 20 years and offer the clearest blueprint for the rest of Europe and the UK to follow, we have focused on the first question. How much does it cost to remove non-compostable plastic from organic waste collections?

In the 1990s, Italy began separate food waste collections and has since built the infrastructure for the largest food waste treatment plants in the EU and possibly the world. Data from 2020 shows Italy treated **4.6 million tonnes (MT) of wet food waste** (+ 1.8 MT green waste and 1.3 MT 'other' waste). **This means nearly 50% of the EU's total food waste is processed in Italy** through two types of facility, combined AD/composting and compost only plants.



15 <https://www.sciencedaily.com/releases/2018/02/180205125728.htm>

16 FAO, 2015: <http://www.fao.org/3/a-i4405e.pdf>

17 FAO, 2015: <http://www.fao.org/3/a-i4405e.pdf>

18 At the time of writing both UNEP and FAO are completing global assessments of plastic accumulation in soil with recommendations to Governments on how to prevent further damage.

19 Soil Pollution – A Hidden Reality. FAO. 2018.

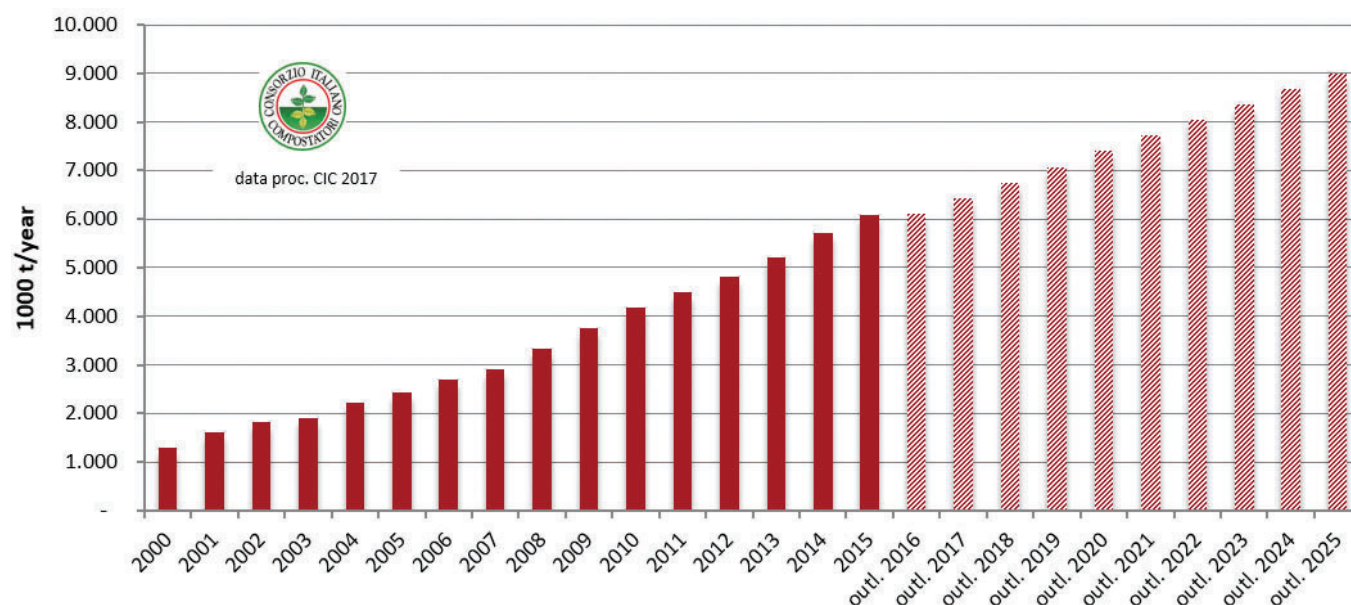
20 Environ Res. 2020 Aug;187:109677. doi: 10.1016/j.envres.2020.109677. Epub 2020 May 20.

21 <https://www.theguardian.com/news/2021/sep/04/how-food-waste-is-huge-contributor-to-climate-change#:~:text=About%20a%20third%20of%20all,UN's%20Food%20and%20Agriculture%20Organisation.>

22 Use a standard carbon cost (50€/ton) and the emissions from organic waste burning and CH4 flaring from landfills.

23 The Role of Compostable Plastics: The case study of Italy – EUBP Webinar March 2021.

ITALY'S BIOWASTE TREATMENT TRAJECTORY – 2000-2025



THREAT

As Italy's food waste collection grew, so did plastic contamination. Today, Italy's food waste treatment plants are contaminated with ~100,000 tonnes of non-compostable plastic of which over 50% is plastic packaging.

You cannot compost plastics. You cannot make biogas from plastics. Plastics must be extracted and sent to landfill or incineration. But extraction also removes 5-10% of the valuable food waste which is estimated to cost ~ €90/120 million/year.²⁴

OPPORTUNITY

The level and the cost of removing the plastic contamination would be significantly higher had Italy not introduced three pieces of legislation:

2010	Food waste collections must use reusable containers or EN13432 certified food waste bags.
2011	Single use plastic carrier bags were banned and replaced with compostable bags to encourage citizens to collect their food scraps and leftovers.
2019	Single use fruit and vegetable bags were banned and replaced with compostable bags to encourage citizens to collect their food scraps and leftovers.

The result is that only 1.5% of Italy's food waste is contaminated by non-compostable plastic bags with an overall plastic contamination rate of just 3%. **This is still a big problem.**

- The cost to remove 100,000 -120,000 tonnes of non-compostable plastic from 4.6MT of food waste costs Italian plants ~€100M/year (or ~ €20/tonne/year).
- Extrapolating this data to the 27 EU Member States who generate ~50MT of food waste per year means the extraction costs will be approximately **€1 billion/year** (50MT x €20/tonne).

This calculation is based on Italy's best-case scenario using a 3% contamination rate. For the UK and other EU countries where the contamination rates are currently significantly higher, the bill will rise exponentially. The costs will be passed to citizens in the form of higher local authority taxes.

One industry does benefit when biowaste collections are diverted to incineration – the private companies who run the incinerator plants. While the EU Single Use Plastic Directive attempts to reduce plastic waste, it ignores the largest single unintended disposal of plastic waste in the UK and EU which is the biowaste stream through which non-compostable plastic packaging is sent erroneously to composting and AD facilities where it should never be in the first place.

²⁴ <https://www.polimerica.it/articolo.asp?id=24090>

²⁵ <https://www.oecd.org/agriculture/topics/water-and-agriculture>

C. CARBON SEQUESTRATION & THE CLIMATE CRISIS POSITION

CONTEXT & THREAT

As farmed soils lose their topsoil, they become less fertile. Once rich and alive soil becomes dry and dead earth. The EU loses a staggering ~15 million tonnes of topsoil annually. Growing food for human consumption is also extremely resource intensive. Food production uses approximately 70% of the world's water²⁵, as well as chemicals, energy and human labour. And yet one-third (1.3B tonnes) of food is lost or wasted globally every year.²⁶ Produced, but uneaten food uses 30% of the world's agricultural land. After being shipped around the globe and delivered to supermarkets, 1/3 of food passes its use-by or best-before date or is bought but thrown away in homes.

Aside from the ethics of this system, food waste is a key driver of climate change which is why Sustainable Development Goal 12.3 exists to cut global food waste by 50% at the retail and consumer levels by 2030.

In addition to the food they provide, oceans and soils are also two of the three ultimate carbon sinks, and while too much carbon is being sunk into oceans and the atmosphere, not enough is returning to soil to safeguard plant growth. The Ellen MacArthur Foundation estimates that just 2% of global food waste produced in our urbanised economies returns to soil because the natural circularity of nutrients and carbon have been disrupted by urbanisation and chemical fertilisers²⁷; the result is a silent emergency in the form of depleted, less fertile and eroded soils.

OPPORTUNITY

Regenerating topsoil and improving its organic carbon content using composted biowaste is a recognised by the UN as a key method to sequester Co2 and mitigate climate change.²⁸ Carbon sequestration through soils is also significantly cheaper than other methods with the additional benefit that healthier soils boost productivity and biodiversity.

The 4:1000 Initiative estimates that an annual increment of organic carbon of just 0.4%, is the equivalent of all annual global greenhouse gas emissions.



THE POLLUTER PAYS

Extended Producer Responsibility (EPR) schemes, designed to hold packaging producers accountable for the recovery and treatment of their products at the end of their lives, have been applied with varying degrees of success across the EU however full cost EPR is coming soon to all countries, including the UK. A key question is how are compostable plastics being defined – and therefore how is EPR being applied?

For now, conventional plastics (global market size ~380 MT) and compostable plastics (global market size ~3MT) are being grouped together in the EU EPR schemes under one umbrella called 'plastics'.²⁹ Italy is the only country with a specific compostable plastic EPR scheme called BIOREPACK, due to the size of its market. Without an EPR that is specific for compostable products, the fees paid by compostable packaging producers will not be used to help build the infrastructure and collection systems needed. Instead, it is likely those fees will fund the promotion of conventional plastics recovery – which represents a misuse of financial resources.

OPPORTUNITY

The current ongoing review of EPR schemes offers two opportunities:

- The UK and EU's current waste management infrastructure is fragmented, incorrectly incentivised and unfit-for purpose at a time when improving the waste management industry needs to be prioritized as a key lever to slow the pace of climate change. This paper advocates that EPR funds be ring-fenced and invested in their entirety to build state-of-the-art waste management collection and treatment infrastructure across the block.
- Differentiated tariffs should be used, similar to the French model, with lower EPR tariffs for products that can be easily (conventionally or organically) recycled, including compostable products. This is called 'eco-modulation' and is key for compostable materials to succeed. Without a clear EPR differentiation – compostable materials will never be cost competitive.

CONCLUSION

Binding legislation is urgently needed to slow the pace of the climate crisis and protect our ecosystems. Eco-modulated EPR tariffs and mandating that certain products like carrier bags use compostable materials are important changes and when passed as legislation, will change the game.

²⁶ <http://www.fao.org/food-loss-and-food-waste/flw-data>

²⁷ <https://ellenmacarthurfoundation.org/cities-and-circular-economy-for-food>

²⁸ <https://www.4p1000.org>

²⁹ See for example the Single Use Plastics Directive which defines compostable plastics, regardless of their bio-based content, as plastics.

THE UNDISPUTED GREEN PRODUCTS

There is widespread agreement that five products namely food waste caddy liners, carrier bags, tea bags, coffee pods and fruit and vegetables stickers, should be mandated to be compostable.³⁰ The tables below show the material currently being used, the scale of the current market, compostable equivalents, legislation, and the benefits for the public and the composting and AD industries.



³⁰ The finished product is independently certified EN13432 or an equivalent standard accepted by the environment protection regulators.

A. CARRIER BAGS & LIGHT WEIGHT BAGS

THE PRODUCT (Typical material composition)	Carrier bags given or sold by supermarkets and light weight and very light weight bags used by smaller shops are typically made of polyethylene.
SCALE OF PROBLEM (Sales/production)	100 billion plastic carrier bags used across Europe per year. 8 billion end up as litter. ³¹
ARE COMPOSTABLE EQUIVALENT PRODUCTS ON THE MARKET TODAY?	UK Co-op stores have been selling carrier bags certified as EN13432 compliant at 10p per bag to replace conventional "single-use" PE bags since April 2021 with Co-op Bags for Life to be sold off in the same month. Co-op will continue to voluntarily report on bag use on DEFRA portals. ³² Aldi are also selling fully certified compostable carrier bags.
PROPOSED ACTIONS	BAN ALL PLASTIC LIGHTWEIGHT RETAIL BAGS (bags for sale and given free-of-charge) THROUGH LEGISLATION. LEGISLATE ALL LIGHTWEIGHT RETAIL BAGS BE CERTIFIED EN13432 COMPLIANT & LABELLED TO SHOW CORRECT DISPOSAL (<i>paper bags exempted</i> ³³).
EXISTING LEGISLATION ³⁴ By EU country	EU - European Parliament ruling (April 2015): All member states to reduce polyethylene bag use by 80% 2025. Denmark & Finland: Leaders in phasing out plastic carrier bags with an average of just 4 plastic bags used per person annually. England: In Oct 2015 a government 5p levy was placed on all polyethylene bags which was raised to 10p and applied to all retailers regardless of size in April 2021. Wales, Ireland and Scotland: A levy of 5p on carrier bags was set (2011) with similar levies in Northern Ireland (2013) and Scotland (2014). Scotland increased its levy to 10p in April 2021. Republic of Ireland: A successful bag levy program (15c/plastic bag) had an immediate effect in 2002. The charge was raised to 22c/bag in 2007. Italy: Banned the sale of non-compostable plastic bags (2012).
ADVANTAGES: Public	1. With ALL carrier bags being compostable, there is no confusion around which bin to put the bag into at the end of the day. 2. Collecting food scraps in a compostable carrier bag avoids the 'ick' factor and increases the volume of food collected by homes by up to 61%. ³⁵ 3. Engaging citizens with food waste collections helps them to identify and understand what they waste and how to change.
ADVANTAGES: Composting and AD industries	COMPOSTING and AD SITES know that 100% of bags are compostable and therefore can confidently manage them without contamination concerns. With a blanket requirement for all carrier bags to be compostable, no specific labelling is required beyond the independent certification's body's certification mark (licensed for use only on products with a valid certificate of conformity to EN 13432) and instructions to give the bag a second life as a food waste caddy liner. Result: More organic food matter captured in the composting stream.
ADVANTAGES: Local Authorities	Local Authorities will reduce the number of caddy liners to supply to citizens as they use compostable carrier bags and thereby save money. Such experience is long established in the Greater Manchester area of the UK and Italy. ³⁶

31 <https://ec.europa.eu/environment/europeangreencapital/englandplasticbag/#:~:text=It%20is%20estimated%20that%20100,each%20of%20these%20countries%20annually.>

32 Bag to Rights. The impact of the Carrier Bag Levy in England, 5 years On Report. April 2021

33 Legislation should also specify that if and when, paper bags are intended to be composted/digested in their EoL phase and labelled as such, they must be independently certified compliant with EN13432.

34 <https://ec.europa.eu/environment/europeangreencapital/englandplasticbag/#:~:text=It%20is%20estimated%20that%20100,each%20of%20these%20countries%20annually>

35 https://issuu.com/declan.breen/docs/food_waste_report_3

36 <https://gmgreencity.com/carrier-bags-in-greater-manchester-are-going-green/>

B.TEA BAGS

THE PRODUCT (Typical material composition)	Paper based teabags commonly contain ~20-30% PP fibre to heat seal.
SCALE OF PROBLEM (Sales/production)	100 million teabags sold in the UK/daily 200 Tonnes of plastic generated. ³⁷
ARE COMPOSTABLE EQUIVALENT PRODUCTS ON THE MARKET TODAY?	Yes. Almost all tea brands are now selling compostable teabags due to consumer demand. A strong example of the market moving before legislation.
PROPOSED ACTIONS	LEGISLATE ALL TEA BAGS BE INDEPENDENTLY CERTIFIED EN13432 COMPLIANT & LABELLED TO SHOW THEIR APPROPRIATE DISPOSAL.
EXISTING LEGISLATION	None to date.
ADVANTAGES: Public	Less confusion about which end of life bin to use.
ADVANTAGES: Composting and AD industries	COMPOSTING and AD SITES know that all teabags are compostable and therefore can confidently manage them without contamination concerns. Result: More organic matter captured in the composting stream.



³⁷ One teabag = 2 grams; 100M teabags x 2g = 200 million grams = 200 tonnes. <https://www.tea.co.uk/tea-faqs>



C. COFFEE PODS

THE PRODUCT (Typical material composition)	Plastic coffee pods containing wasted coffee grinds are very difficult to recycle unless they reach a specialist facility. ³⁸
SCALE OF PROBLEM (Sales/production)	An estimated 20bn capsules are used every year worldwide ³⁹ of which an increasing percentage are plastic.
ARE COMPOSTABLE EQUIVALENT PRODUCTS ON THE MARKET TODAY?	Yes. A number of brands are already selling compostable coffee pods including Eden Project, Percol, Blue Goose and Lavazza.
PROPOSED ACTIONS	LEGISLATE FOR A BAN ON ALL PLASTIC COFFEE PRODUCTS. LEGISLATE ALL PLASTIC COFFEE CAPSULE PRODUCTS ARE CERTIFIED EN13432 COMPLIANT & LABELLED TO SHOW THEIR APPROPRIATE DISPOSAL.
EXISTING LEGISLATION	None to date.
ADVANTAGES: Public	Less confusion about which end of life bin to use.
ADVANTAGES: Composting and AD industries	COMPOSTING and AD SITES know that all coffee pods are compostable and therefore can confidently manage them without contamination concerns. Result: More organic matter captured in the composting stream.

38 <https://www.nature.com/articles/s41598-020-65058-1>

39 <https://www.theguardian.com/business/2020/nov/20/nestle-first-uk-wide-coffee-pod-recycling-scheme>

D. FRUIT & VEGETABLE STICKERS

THE PRODUCT (Typical material composition)	Fruit and vegetables stickers are typically made of PE and PP and despite being small, can represent a serious source of plastics in compost/digestate.
SCALE OF PROBLEM (Sales/production)	1,000 Tonnes of plastic generated in EU. ⁴⁰
ARE COMPOSTABLE EQUIVALENT PRODUCTS ON THE MARKET TODAY?	Yes. Compostable labels using PLA and PLA+PBAT blends, starch blends and PHB. ⁴¹ Alternatively, laser branding means no labels are used at all. Co-op (UK) have a policy to only use paper or compostable labels.
PROPOSED ACTIONS	LEGISLATE FOR A BAN ON ALL PLASTIC STICKERS. LEGISLATE ALL STICKERS BE CERTIFIED EN13432 COMPLIANT & LABELLED TO SHOW THEIR APPROPRIATE DISPOSAL. ENCOURAGE LASER LABELLING METHODS.
EXISTING LEGISLATION	In Ireland plastic fruit stickers will be banned from 2021 unless they are necessary to give the shopper mandatory information. ⁴²
ADVANTAGES: Public	Less confusion about which end of life bin to use.
ADVANTAGES: Composting and AD industries	COMPOSTING and AD SITES know that all fruit and vegetable labels are compostable and can confidently accept them without contamination concerns. Result: More organic food matter captured in the composting stream.



40 NOVA Institute, Fact Sheet Household & Garden: Stickers for fruit and vegetables

41 NOVA Institute, Fact Sheet Household & Garden: Stickers for fruit and vegetables

42 Cre Presentation [2021]



E. FOOD CONDIMENT SACHETS

THE PRODUCT (Typical material composition)	Small plastic food condiment sachets are typically made with multiple-layer laminates which include Polyethylene and metallic foils. Tomato ketchup is one of the most iconic foods using sachets alongside mayonnaise, mustard and soy sauces which also use this type of packaging. Sachets are also used extensively by the beauty industry for give-away samples.
SCALE OF PROBLEM (Sales/production)	Nearly 1 trillion food condiment sachets are produced annually worldwide. These small plastic pouches are uncollectable, unrecyclable and cause significant environmental pollution.
ARE COMPOSTABLE EQUIVALENT PRODUCTS ON THE MARKET TODAY?	Compostable food sachets are not yet widely commercially available however research is ongoing to identify material fusions that effectively protect the product and can be disposed of with food waste at their end-of-life.
PROPOSED ACTIONS	BAN ALL PLASTIC FOOD CONDIMENT SACHETS. LEGISLATE ALL ARE CERTIFIED EN13432 COMPLIANT & LABELLED TO SHOW CORRECT DISPOSAL.
EXISTING LEGISLATION	No legislation currently in place to manage the use of small plastic food sachets.
ADVANTAGES: Public	Less confusion. All sachets would go into the food waste bin.
ADVANTAGES: Composting and AD industries	COMPOSTING and AD SITES know that 100% of food sachets are compostable and therefore can confidently manage them without contamination concerns. Result: More organic food matter captured in the composting stream.

F. HOT READY-MEAL TRAYS

THE PRODUCT (Typical material composition)	Ready-meal trays for hot foods designed to be heated are typically made of PET or CPET (Crystalline Polyethylene Terephthalate) – which can be heated. Cold ready-meal trays are excluded in this context as the food does not stick to the packaging as it does with hot meals.
SCALE OF PROBLEM (Sales/production)	The market for ready meals which are microwaved or oven-cooked is growing with demand from increasingly urbanised populations. Projections for ready meals packaging is anticipated to grow with a growth rate of 4-6% between 2021-2031. ⁴³
ARE COMPOSTABLE EQUIVALENT PRODUCTS ON THE MARKET TODAY?	Very few brands are currently using hot meal trays that are compostable.
PROPOSED ACTIONS	BAN ALL PLASTIC HOT MEAL TRAYS. LEGISLATE ALL ARE CERTIFIED EN13432 COMPLIANT & LABELLED TO SHOW CORRECT DISPOSAL.
EXISTING LEGISLATION	No legislation currently in place.
ADVANTAGES: Public	Public will know that all hot ready-meal trays are compostable and should be collected with food waste.
ADVANTAGES: Composting and AD industries	COMPOSTING and AD SITES know that all hot meal trays are compostable and therefore can confidently manage them without contamination concerns. Result: More organic food matter captured in the composting stream.



43 <https://www.futuremarketinsights.com/reports/ready-meals-packaging-market>

THE RED & GREEN LIST

The list below shows products which we recommend should (green list) ⁴⁴ and should not (red list) be using compostable materials. A number of other Red & Green or Go & No-Go lists have been compiled, only four have a red section containing a limited number of items.


This Red & Green list (i) amalgamates existing lists (ii) includes new products (iii) provides a clear rationale each product's classification.

✗ = NO (Old Thinking)

✓ = YES (New Thinking)


GREEN LIST RECOMMENDATION

Use compostable materials for these products

	PRODUCT	RATIONALE		
		1	2	3
		Carries food, beverage residues, plant waste or soil to composting or AD facilities	Too small, flimsy, flexible, multi-laminated and hard to recycle in any other waste stream	When made of non-compostable plastic, product currently contaminates biowaste stream
	BAGS			
1	Carrier bags and light weight bags Preferably designed as kitchen caddy food waste bin liners.	✓	✓	✓
2	Kitchen caddy and food waste bin liners	✓	✓	✓
3	Light & very light weight bags for fruits/vegetables Preferably designed as kitchen caddy food waste bin liners.	✓	✓	✓
	TEAS & COFFEE PRODUCTS			
4	Teabags	✓	✓	✓
5	Plastic coffee pods, pads, filters	✓	✓	✓
	LABELS			
6	Fruit and vegetable stickers	✓	✓	✓
	FOOD PACKAGING PRODUCTS			
7	HOT Ready Meal Trays (always food-contaminated)	✓	✓	✓
8	Films (for food trays)	✓	✓	✓
9	Fruit nets	✓	✓	✓
10	Cling film used in food packaging	✓	✓	✓
11	Multi-layer food packaging / wrappers	✓	✓	✓
12	Food condiment sachets	✓	✓	✓
13	Twist wraps for sweets	✓	✓	✓
	SPECIFIC CLOSED LOOP ENVIRONMENTS (FESTIVALS)			
14	Catering plates, cups, bowls and platters	✓	✓	✓
15	Catering cutlery	✓	✓	✓
16	Food condiment sachets	✓	✓	✓
17	Bags for collecting compostable items / food waste	✓	✓	✓

⁴⁴ Finished products independently certified EN 13432 compliant or an equivalent standard accepted by the environment protection regulators.

RED LIST RECOMMENDATIONDo not use compostable materials for these products

	PRODUCT	RATIONALE		
		1	2	3
		Note that 1, 2 and 3 are different in the Green and Red Lists. Our key criterion is whether the item carries food waste to composting or AD facilities; all red list items fail.		
		Carries food waste to composting or AD facilities	Easy to compost or anaerobically digest	Can only be made of a compostable material
1	Pallet shrink wrap	×	×	×
2	Compostable bottles ⁴⁵	×	×	×
3	Non-food packaging bags	×	×	×
4	Mailing bags	×	×	×
5	Dental hygiene products	×	×	×
6	Clothing apparel and shoes	×	×	×
7	Wipes (non-food) ^{46, 47}	×	×	×
8	Sheet face masks	×	×	×
9	Foam packaging for pharmaceuticals	×	×	×
10	Personal care & cosmetic packaging	×	×	×
11	Personal care & cosmetic single dose sachets	×	×	×
12	Newspaper & magazine sleeves	×	×	×
13	Protective packaging for electricals (TV corners) ⁴⁸	×	×	×

⁴⁵ PET bottles may be one of the few products that can be recycled a limited number of times. Using precious resources to make compostable bottles therefore looks like a step backwards when a system-change towards refill systems and concentrates which are diluted at home would be a better solution to the problem.

⁴⁶ Reviewer Notes: NGOs pressing non-food wipes to be viscose or paper because they are commonly littered or flushed, despite Bag & Bin, Don't Flush.

⁴⁷ Reviewer Notes: EN13432 non-food wipes should not be on green list because they are used as cleansing products, removing old make-up that includes microbeads, wiping babies/toddlers' bottoms. Unacceptable in the organics recycling sector.

⁴⁸ Use pulp products which are accepted in the paper recycling stream to protect high value products during transport. Funghi alternatives are an interesting and growing new source of bulk packaging materials suitable for composting. Wool based insulating materials for packaging can also be composted both at home and industrially. These are momentarily out of scope here.

ANNEX 1

HOW COULD THE UK'S ANAEROBIC DIGESTION SECTOR MANAGE COMPOSTABLE PRODUCTS?

The foreseen increase in volumes of wet food waste post 2024 will lead to the construction of many new AD plants to treat those volumes. Wet AD produces digestate which amounts to circa 95% of the food waste treated and this requires management. Some EU countries that currently have an AD sector for managing food waste tend to have a post-digestion composting phase for separated fibre digestate. This is the case in Italy for example. In Austria, digestate is incinerated due to its perceived harmful properties. In the UK the predominant AD investment type in the UK's is 'wet-AD only' with relatively limited production of separated fibre digestates and uncertain numbers of those facilities having a policy of aerobically maturing (akin to composting) their separated fibre digestates. Therefore, most UK digestates are spread to soil with limited pre-treatment.

AD is the highest preference treatment option for separately collected food wastes in the UK and the prevalent type of treatment option. Discarded industrially compostable products would be suitable for feeding into an AD facility's digester only if:

- 1) The site uses front-end treatment steps that make them suitable for pumping through their system (in systems that rely on pumps), and more susceptible to biodegradation conditions in the digestion treatment phase(s); and
- 2) There is no floating layer of industrially compostable products in the digester; and
- 3) it uses a post-digestion separation step that separates any residues of them into a stackable fibre digestate fraction which is then,
 - a. aerobically matured on-site or
 - b. sent to a composting facility so that biodegradation of those residues is completed; or
- 4) As an alternative to 1), 2) and 3) it has done a trial that has demonstrated that industrially compostable products were successfully managed and biodegraded by the end of the facility's last phase of biological treatment, and
- 5) Contamination by non-compostable items does not exceed relevant contaminants limits in the AD operator's permit to operate and contract.

In consequence, government should look to mandate the above processes, in order to ensure compostable packaging is indeed composted once placed in food waste streams. Moreover, such processes will also benefit AD operators in terms of reduced volumes to be sent to incineration/landfill and improved quality outputs of digestate or compost to be spread to soil, containing less plastic waste.

A further option is that where AD operators and their waste collection clients accept discarded industrially compostable products, the majority of them could, at least in the short term, remove those products during waste pre-treatment then - provided contamination by non-compostable items is low enough - send them for biodegradation in appropriate in-vessel composting facilities at a cost far inferior to incineration.

A PLASTIC PLANET

THE COMPOSTABLE CONUNDRUM

Last updated October 2021